

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application

Applicant(s): D et al.
Docket No.: 1-4-2-1-3
Serial No.: 10/620,044
Filing Date: July 15, 2003
Group: 2616
Examiner: Pawaris Sinkantarakorn

Title: Extensible Traffic Generator for
Synthesis of Network Data Traffic

REPLY BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The remarks which follow are submitted in response to the Examiner's Answer dated March 13, 2009, in the above-identified application. The arguments presented by Appellants in the corresponding Appeal Brief are hereby incorporated by reference herein.

In Section 10 of the Answer, on pages 7-11 thereof, the Examiner responds to various arguments raised by Appellants in the Appeal Brief.

REMARKS

I. Rejection of claims 20 and 21 under 35 U.S.C. §101 (pages 7-8 of the Answer)

Appellants again note that claims 20 and 21 each recite an article of manufacture comprising a computer-readable storage medium encoded with one or more data structures comprising information characterizing one or more traffic flows associated with at least one traffic generator, represented as a string which includes a global header followed by one or more frames each having an associated frame header.

The Examiner argues that claims 20 and 21 are non-statutory because “[w]ithout generating data structure (i.e. traffic file), the data structure embedded on a computer-readable storage medium is a mere arrangement of data, which is nonfunctional descriptive material. . . . [and] is not statutory since no requisite functionality is present to satisfy the practical application requirement. . . .”

The Examiner apparently contends that only executable computer programs are functional descriptive material which may be patentable when recorded on a computer-readable medium, and that data structures are nonfunctional descriptive material, and hence non-statutory even when recorded on a computer-readable medium. Such an interpretation is clearly contrary to the plain language of MPEP 2106.01, which indicates that data structures and computer programs are distinct, and that both are examples of functional descriptive material (internal citations omitted):

Descriptive material can be characterized as either “functional descriptive material” or “nonfunctional descriptive material.” In this context, “functional descriptive material” consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of “data structure” is “a physical or logical relationship among data elements, designed to support specific data manipulation functions.”) “Nonfunctional descriptive material” includes but is not limited to music, literary works, and a compilation or mere arrangement of data.

Both types of “descriptive material” are nonstatutory when claimed as descriptive material per se. When functional descriptive material is recorded on some computer-readable medium, it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. When nonfunctional descriptive material is recorded on some computer-readable medium, in a

computer or on an electromagnetic carrier signal, it is not statutory since no requisite functionality is present to satisfy the practical application requirement.

Appellants note that MPEP 2106.01 indicates that “a claimed computer-readable medium encoded with a data structure defines structural and functional interrelationships between the data structure and the computer software and hardware components [of the computer which reads the medium] which permit the data structure’s functionality to be realized, and is thus statutory.” See also *In re Beauregard*, 53 F.3d 1583, 35 USPQ2d 1383 (Fed. Cir. 1995); *In re Lowry*, 32 F.3d 1579, 32 USPQ2d 1031 (Fed. Cir. 1994). Indeed, in *Lowry*, the court held that a claim directed to “a memory for storing data for access by an application program being executed on a data processing system, comprising a data structure stored in said memory, said data structure including information resident in a database used by said application program,” was statutory, even though the claim did not require that the application program also be stored on the claimed memory. See *Lowry*, 32 USPQ2d at 1033 (with reference to claim 1).

Appellants respectfully submit that the data structures recited in claims 20 and 21, which comprise information characterizing one or more traffic flows associated with at least one traffic generator, represented as a string which includes a global header followed by one or more frames each having an associated frame header, define a “physical or logical relationship among data elements, designed to support specific data manipulation functions.” As described in the present specification at page 6, lines 8-11, illustrative embodiments of the claimed data structures “provide a particularly efficient mechanism for specifying a wide variety of different types of traffic, without undue limitation as to number of protocols, size or arrival time distribution models, parameter sequences, or other features.”

As such, the data structures recited in claims 20 and 21 “impart functionality when employed as a computer component,” and are hence functional descriptive material. Claims 20 and 21 therefore recite statutory subject matter, namely, a computer-readable medium encoded with functional descriptive matter comprising one or more data structures which provide such significant benefits as increased efficiency.

Appellants further note that there are no prior art rejections of claims 20 and 21. Moreover, Appellants respectfully submit that claims 20 and 21 include limitations similar to

those recited in allowable claims 12 and 13, respectively. As such, claims 20 and 21 are also believed to be allowable over the prior art.

II. Rejection of Claims 1-10 and 14-19 under 35 U.S.C. §102(b) over Gerrevink

A. Claims 1-10, 14-16, 18 and 19 (pages 8-9 of the Answer)

Independent claim 1 includes a limitation wherein at least one of a plurality of output interfaces of the traffic generator has two or more of the traffic flows associated therewith. Appellants note that the singular verb “has” clearly refers to “at least one” rather than to a “plurality” as a whole. An illustrative embodiment is shown in FIG. 2, in which each of output interfaces 202-1, 202-2 and 202-3 has one or more traffic flows associated therewith and output interface 202-1 has three traffic flows associated therewith.

The Examiner argues that “the limitation ‘at least one of a plurality of output interfaces of the traffic generator has two or more of the traffic flows associated therewith’ can be broadly interpreted as ‘multiple output interfaces of the traffic generator has two or more of the traffic flows associated therewith’ because the limitation ‘at least one’ suggests that there may be more than one.” See the Answer at page 7, last paragraph (underlining in original).

Appellants submit that the limitation at issue includes arrangements in which, for example, a first output interface has two or more of the traffic flows associated therewith, and a second output interface has two or more of the traffic flows associated therewith. However, the limitation would not be met by an arrangement in which, for example, each of a plurality of output interfaces has only one traffic flow associated therewith, even if each of the plurality of output interfaces has a different traffic flow associated therewith. In such an arrangement, even though the plurality of output interfaces have two or more traffic flows associated therewith, not one of the plurality of output interfaces has two or more of the traffic flows associated therewith.

The Examiner argues that “Gerrevink discloses that multiple streams are forwarded to multiple output ports (see paragraph 31), where the streams are broadly interpreted as traffic flows. Therefore, Gerrevink discloses that at least one of a plurality of output interfaces of the traffic generator has two or more of the traffic flows associated therewith.” See the Answer at page 8, last paragraph.

Appellants respectfully maintain that the output ports described in the relied-upon portions of Gerrevink are not output interfaces of a traffic generator, as recited in claim 1, for the reasons discussed in the Appeal Brief. Nonetheless, even assuming for the sake of argument that the output ports of Gerrevink could be characterized as output interfaces of a traffic generator, and further assuming that the streams could be characterized as traffic flows, Gerrevink still fails to meet the limitation at issue.

Gerrevink at paragraph [0031] indicates that the traffic generation scheme discussed therein may be utilized to “send multiple streams of network traffic (e.g., IP traffic) through a System under Test (SUT) and have those streams forwarded to multiple output ports of the SUT.” However, there is no teaching or suggestion that at least one of the multiple output ports has two or more of the multiple traffic streams associated therewith. Indeed, Gerrevink explicitly defines a “traffic stream” in paragraph [0016] thereof: “Within this context, a traffic stream consists of a set of packets transmitted by one port that have a set of destination addresses corresponding to the set of networks (or routes) reachable at a particular output port.” (emphasis added)

Gerrevink thus discloses an arrangement each output port transmits a traffic stream consisting of the set of packets that have a set of destination addresses corresponding to the set of networks (or routes) reachable at that particular output port. As discussed above, such an arrangement, in which the multiple output ports each have only one of the multiple traffic streams associated therewith, fails to meet the limitation at issue of claim 1.

Independent claims 18 and 19 include limitations similar to those of independent claim 1 and are thus believed to be patentable for at least the reasons identified above with regard to claim 1.

Dependent claims 2-10 and 14-16 are believed to be patentable for at least the reasons identified above with regard to claim 1.

B. Claim 17 (page 9 of the Answer)

In addition to being allowable because of its dependency from independent claim 1, dependent claim 17 defines separately patentable subject matter. Claim 17 recites a limitation wherein the traffic generator is implemented primarily in software and is configured to generate data traffic files that are utilizable in another traffic generator implemented primarily in hardware.

The Examiner apparently contends that this limitation is disclosed by paragraphs 34 and 36 of Gerrevink, which state that:

[0034] The test box 110 includes a processor 105 for executing program instructions, a graphical user interface (GUI) program 130 for interaction with a user (e.g., a test equipment operator), and a plurality of buttons 138 for allowing the user to provide input. . . .

[0036] The data generation is managed in the test box 110 by the use of an interdeparture queue 101, which functions to store data representative of at least one selected traffic model, comprising both a pattern of data traffic and a traffic load. A traffic model is selected for each of a plurality of input streams, and multiple different traffic models can be concurrently supported. A departure scheduler 102 reads this stored data out of the lists maintained by the interdeparture queue 101 to identify the temporal relationships of data outputs among the plurality of input data streams. The departure scheduler 102 identifies the desired time of departure of each data packet as well as the selected stream from which the data packet originates. The departure scheduler 102 drives a traffic generator 103, which produces the resultant output data stream for transmission to the equipment under test 106.

On page 9 of the Answer, the Examiner contends that “Gerrevink discloses a test system comprising a test box including a processor for executing program instructions (see Figure 1 and paragraph 34), wherein the program instructions are implemented primarily in software. Gerrevink also discloses that the data generation is managed in the test box by the use of an interdeparture queue, which functions to store data representative of at least one selected traffic model, comprising both a pattern of data traffic and a traffic load (see paragraph 36), where the traffic model are utilizable by the test box 110, which is implemented primarily in hardware.”

In other words, the Examiner argues that Gerrevink discloses a test box (described in paragraph 34) which executes program instructions, implemented primarily in software, in order to generate a traffic model utilizable by a test box (described in paragraph 36), implemented primarily in hardware. However, paragraphs 34 and 36 of Gerrevink are describing the same test box, namely, that designated with reference numeral 110 in FIG. 1 of Gerrevink. Not only is it logically impossible for test box 110 to be both “implemented primarily in software” and “implemented primarily in hardware,” but claim 17 clearly requires that a traffic generator, implemented primarily in software, be configured to generate data traffic files that are utilizable in another traffic generator, implemented primarily in hardware.

Appellants further note that the relied-upon portion of Gerrevink discloses an arrangement wherein test box 110 includes a single “traffic generator 103, which produces the resultant output data stream for transmission to the equipment under test 106.” As heretofore discussed, the equipment under test is not a traffic generator. Thus, Gerrevink fails to disclose an arrangement wherein a traffic generator is configured to generate data traffic files that are utilizable in another traffic generator, much less the arrangement recited in claim 17 wherein wherein a traffic generator, implemented primarily in software, is configured to generate data traffic files that are utilizable in another traffic generator, implemented primarily in hardware.

III. Rejection of claim 11 under 35 U.S.C. §103(a) over Gerrevink (pages 9-11 of the Answer)

Dependent claim 11 includes a limitation wherein a traffic file is represented as a string which includes a global header followed by one or more frames each having an associated frame header. The Examiner concedes that Gerrevink fails to disclose this limitation of claim 11. Rather, the Examiner relies on column 1, lines 46-49, of U.S. Patent No. 6,178,456 (hereinafter “Zhou”), to supplement the teachings of Gerrevink by allegedly disclosing that “it is well known in the art that the global header is followed by frames wherein each frame has a frame header.”

The relied-upon portion of Zhou discloses that in “ATM communication systems, transmissions typically include a large, global header followed by a series of frames, each having its own header address for the data transmitted in the frame.” Even assuming arguendo that Zhou’s disclosure of a transmission including a “global header followed by a series of frames,

each having its own header address for the data transmitted in the frame” could be analogized to the limitation of claim 11 wherein a global header is followed by one or more frames each having an associated frame header (i.e., that the header address disclosed by Zhou could be analogized to the frame header recited in claim 11), there remains no teaching or suggestion directed to the limitation of claim 11 wherein a traffic file is represented as a string which includes a global header followed by one or more frames each having an associated frame header. Rather, Zhou discusses transmissions in ATM communication systems, rather than a traffic file which stores information characterizing one or more of such traffic flows.

Moreover, even assuming that it were possible to have combined Gerrevink and Zhou to reach the limitations of claim 11, “a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art;” rather, the Examiner must provide an explicit “reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR International Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (U.S. 2007)

On page 10, last paragraph, of the Answer, the Examiner argues that the “benefit of having global header preceding a series of frames is generally known to one of ordinary skill in the art, where the benefit is that each frame shares a single global header to allow consistency in the system because every frame complies with the global header.”

The Federal Circuit has held that an assessment of basic knowledge and common sense that is not based on any evidence in the record lacks “substantial evidence” support and may not form the basis for a rejection. *In re Zurko*, 258 F.3d 1379, 1385, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001). Rather, specific knowledge of the prior art must always be supported by citation to some reference work recognized as standard in the pertinent art. *In re Ahlert*, 424 F.2d 1088, 1091, 165 USPQ 418, 420-21 (CCPA 1970).

As such, the proffered motivation appears to be a conclusory statement of the type ruled legally insufficient by the both Supreme Court and the Federal Circuit. See *KSR*, 127 S.Ct. at 1741, 82 USPQ2d at 1396, quoting *In re Kahn*, 441 F. 3d 977, 988 (Fed. Cir. 2006) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements;

instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.”).

Indeed, as discussed in the Appeal Brief, the Zhou reference explicitly teaches away from the proposed combination. As recently noted by the Supreme Court, “when the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be nonobvious.” *KSR*, 82 USPQ2d at 1395 (citing *United States v. Adams*, 383 U.S. 39, 51-52, 148 USPQ 479, 484 (1966)).

In view of the above, Appellants believe that claims 1-21 are in condition for allowance, and respectfully request the withdrawal of the present rejections.

Respectfully submitted,

/des/

Date: May 13, 2009

David E. Shifren
Attorney for Appellant(s)
Reg. No. 59,329
Ryan, Mason & Lewis, LLP
90 Forest Avenue
Locust Valley, NY 11560
(516) 759-2641